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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,613	07/06/2001	Masamichi Fujiwara	P/3241-18	6086
2352	7590	10/30/2003	EXAMINER LEE, JOHN D	
OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 10/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/900,813

Applicant(s)

FUJIWARA ET AL.

Examiner

John D. Lee

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(e). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-153 is/are pending in the application.  
4a) Of the above claim(s) 1-12, 45-63, 152 and 153 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38 and 42-44 is/are allowed.
- 6) ☒ Claim(s) 13-18, 21-31, 34, 39-41, 66-116, 127-131 and 147-151 is/are rejected.
- 7) ☒ Claim(s) 19, 20, 32, 33, 35-37, 64, 65, 117-126 and 132-146 is/are objected to.
- 8) ☒ Claim(s) 1-153 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1) ☒ Certified copies of the priority documents have been received.  
2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9701. 6) ☐ Other: \_\_\_\_\_

Applicant's election without traverse of Invention II (claims 13-44 and 64-151) in Paper No. 0903 is acknowledged. Claims 1-12, 45-63, 152, and 153 stand withdrawn from further consideration by the examiner, 37 CFR § 1.142(b), as being drawn to a non-elected invention.

Receipt is acknowledged of papers submitted under 35 U.S.C. §§ 119(a)-(d), which papers have been placed of record in the file.

The drawings are objected to because Figures 29(e) and 32(e) are improperly labeled as 29(c) and 32(c), respectively. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The abstract of the disclosure is objected to because it should be revised to correspond only to the elected invention. Correction is required. See MPEP § 608.01(b).

The specification is objected to for the following noted informalities in the Brief Description Of The Drawings (pages 8, 9, 11, 14, and 16). The reference to **Figure 7** should actually be to **Figures 7(A)-7(D)**; the reference to **Figure 15** should actually be to **Figures 15(A)-15(C)**; the reference to **Figure 28** should actually be to **Figures 28(a)-28(g)**; the reference to **Figure 29** should actually be to **Figures 29(a)-29(f)**; the reference to **Figure 32** should actually be to **Figures 32(a)-32(f)**; the reference to **Figure 54** should actually be to **Figures 54(a)-54(e)**; the reference to **Figure 55** should actually be to **Figures 55(a)-55(i)**; the reference to **Figure 58** should actually be to **Figures 58(a)-58(c)**; the reference to **Figure 59** should actually be to **Figures 59(a)-59(c)**; and the reference to **Figure 71** should actually be to **Figures 71(a)-71(c)**. Applicant's

cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

Claims 14, 19, 20, 65, 71-75, and 122-126 are objected to because of the following minor informalities. In claim 14, line 2, "arc" should be "is". In claim 19, line 3, "single" should be "signal". In claim 20, line 3, "port" (singular) should be "ports" (plural). In claim 65, line 4, "port" (singular) should be "ports" (plural). In claim 65, line 6, "predetermine" should be "predetermined". In line 5 of each of claims 71-75, "the combine" should be "then combine". In line 4 of each of claims 122-126, "aid" should be "said".

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21-23, 29, 34, 39-41, 66-80, 106, 127-131, and 147-151 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 21, line 2, there is no antecedent support for the term "said modulator", thus rendering the claim indefinite. The correct term would be "said modulating section". Claims 22 and 23, being dependent upon claim 21, inherently contain the same indefiniteness. In claim 29, line 3, there is no antecedent support for the term "said sinusoidal signal voltages" because of the word "sinusoidal". The claim is thus indefinite. In line 5 of claim 34, it is not known what is meant by "a second branching means inputted said signal light through said modulating means thereto". This phrase makes no grammatical sense and its meaning cannot be discerned even in context with the remaining claim language. The claim is therefore indefinite. Claim 39 is indefinite because the following terms (used in

the equations) are undefined: "**P<sub>i</sub>**", "**γ**", "**BW<sub>SE</sub>**", and "**P<sub>LAS</sub>**". Claims 149-151, being dependent upon claim 39, inherently contain the same indefiniteness. Claim 40 is indefinite because the following terms (used in the equations) are undefined: "**e**", "**η**", "**h**", and "**v**". Also in claim 40, in line 12, "outputs from said modulators" should actually be "output from said modulator". Further, in the last line of claim 40, the use of the symbol "**W**" is unclear. It is believed that "watts" is intended. Claim 41 is indefinite because the following terms (used in the equations) are undefined: "**e**", "**η**", "**h**", and "**v**". Also in claim 41, in line 16, "outputs from said modulators" should actually be "output from said modulator". Further, in the last line of claim 41, the use of the symbol "**W**" is unclear. It is believed that "watts" is intended. In line 3 of each of claims 66-70, there is no antecedent support for the term "said modulator", thus rendering the claims indefinite. The correct term would be "said modulating section". Claims 71-80, being dependent upon claims 66-70, inherently contain the same indefiniteness. In line 4 of claim 106, there is no antecedent support for the term "said sinusoidal signal voltages" because of the word "sinusoidal". The claim is thus indefinite. In line 5 of each of claims 127-131, it is not known what is meant by "a second branching means inputted said signal light through said modulating means thereto". This phrase makes no grammatical sense and its meaning cannot be discerned even in context with the remaining claim language. The claims are therefore indefinite. Claim 147 is indefinite for precisely the same reasons as claim 40, discussed above, and claim 148 is indefinite for precisely the same reasons as claim 41, discussed above.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-15, 21-23, 28, 30, 66, 67, 71, 72, 76, 77, 101, 102, 107, and 108 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Veselka et al (IEEE PHOTONICS TECHNOLOGY LETTERS, July 1998), submitted by applicant. Veselka et al discloses a multi-wavelength generating apparatus for modifying an incident light of a single central wavelength using a signal voltage of a predetermined period to thereby generate a multi-wavelength light of plural central wavelengths. See Figure 1. The Veselka et al apparatus comprises a Mach-Zehnder amplitude modulator coupled between input and output sections of optical waveguide, with voltage applying means (microwave synthesizer) which independently regulates the signal voltage applied to the Mach-Zehnder modulator. Notice that this single modulator apparatus reads directly on applicant's "one or more modulating means" claim language. An optical amplifier (EDFA) is located in the optical path of the Veselka et al apparatus from which the multi-wavelength signal is output. The Veselka et al voltage applying means provides sinusoidal voltages of predetermined period (which predetermined period is inherently a "predetermined temporal waveform signal").

Claim 13 is further rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent 5,436,757 to Okazaki et al. Okazaki et al discloses a multi-wavelength generating apparatus for modifying an incident light of a single central wavelength using a signal voltage of a predetermined period to thereby generate a multi-wavelength light of plural central wavelengths. The Okazaki et al apparatus comprises a series of phase modulators coupled between input and output sections of optical waveguide, with a voltage applying means which independently regulates the signal voltage applied to each modulator.

Claims 16-18, 24-27, 31, 68-70, 73-75, 78-100, 103-105, and 109-116 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Veselka et al (IEEE PHOTONICS TECHNOLOGY LETTERS, July 1998), submitted by applicant. As indicated above, the Veselka et al Mach-Zehnder modulator provides amplitude modulation. Because the light in a Mach-Zehnder modulator is split and then recombined, however, one of ordinary skill in the art would have found it obvious to use a Mach-Zehnder modulator in the reference apparatus which provides phase modulation (including appropriate phase adjusting means), or to use one which provides both amplitude and phase modulation. The use of other equivalent light amplitude modulators, such as electro-absorption intensity modulators, would likewise have been obvious. Note that voltage is applied independently to each of the two arms of the Veselka et al Mach-Zehnder modulator. This is akin to applying voltage to one of the arms as a bias, so that applicant's claimed "biasing" arrangement would have been obvious in the reference. Multiplying the applied signal voltage in Veselka et al would have been another obvious extension of the teachings therein, in order to achieve a predetermined appropriate signal strength.

Claims 38 and 42-44 are allowed. The prior art does not disclose or reasonably suggest a coherent multi-wavelength signal generating apparatus of the type claimed, wherein a control means controls the shape of a spectrum of the input multi-wavelength light so that a relative intensity noise  $RIN(i)$  from an  $i$ -th wavelength component obtained by spectrum slicing meets the equations set forth in claim 38.

Claims 19, 20, 32, 33, 35-37, 64, 65, 117-126, and 132-146 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not disclose or reasonably suggest a multi-wavelength generating apparatus which includes the modulator limitations of these claims, or which includes the branching/monitoring/bias controlling limitations of these claims, or which includes multiplexing means arranged as claimed.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other related multi-wavelength generating apparatuses for modifying an incident light of a single central wavelength to thereby generate a multi-wavelength light of plural central wavelengths can be seen in the cited U.S. Patents to Esaki et al, Buchman et al, and Galvanauskas et al.

All of the prior art documents submitted by applicant in the Information Disclosure Statement filed on July 30, 2001 (including the Veselka et al article relied on in the rejections above), have been considered and made of record. Note the attached initialed copy of form PTO-1449.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the



various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(e) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.

  
**John D. Lee**  
**Primary Patent Examiner**  
**Group Art Unit 2874**